Amendments to the Claims

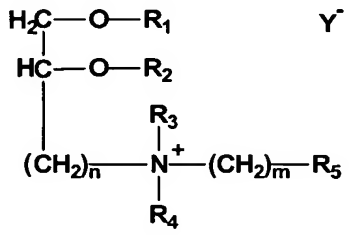
This listing of claims will replace all prior versions, and listings of claims in the application. Please cancel claims 1-63, and add new claims 64-90.

Listing of claims:

Claims 1-63 (cancelled).

64. (New) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

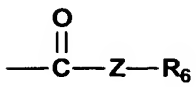


R_1 and R_2 are independently H; linear or branched, unsubstituted or substituted $C_{1\text{-}23}$ alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of $-O-(CH_2)_k-CH_3$,$-S-(CH_2)_k-CH_3$, and $X-(CH_2)_k-$, wherein X is a halide, and k is 0 to 4;

R_3 and R_4 are independently H; linear or branched, unsubstituted or substituted $C_{1\text{-}23}$ alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5

heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of $-O-(CH_2)_k-CH_3$,$-S-(CH_2)_k-CH_3$, and $X-(CH_2)_k-$, wherein X is a halide, and k is 0 to 4;

R_5 has the structure



wherein Z is selected from the group consisting of O, S, NR_1, NH, Se, and CR_7R_8;

R_6 is selected from the group consisting of H, R_1, R_2, R_3, and R_4, and, when Z is O, NH, NR_1, or S, R_6 can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein Z is an atom of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent;

n is 1 to 6;

m is 1 to 10;

Y is a pharmaceutically acceptable anion; and

R_7 and R_8 independently or in combination are H or alkyl groups as defined for R_1 and R_2;

wherein if Z is O, n is 1, and m is 3, then R_6 is selected from the group defined for R_3 and R_4 and wherein R_1 and R_2 are not both H; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

65. (New) The method according to claim 1, wherein R_1 and R_2 are C_{10} to C_{20} alkyl or alkenyl groups, Z is O and R_6 is an amino acid or peptide linked to Z as an ester.

66. (New) The method according to claim 64, wherein Z is O, R_1 and R_2 are identical and are selected from the group consisting of $C_{14}H_{29}$ and $(CH_2)_8CH=CH(CH_2)_7CH_3$, and R_3 and R_4 are methyl.

67. (New) The method according to claim 64, wherein R_1 and R_2 are saturated or unsaturated C_{10}-C_{18} alkyl groups.

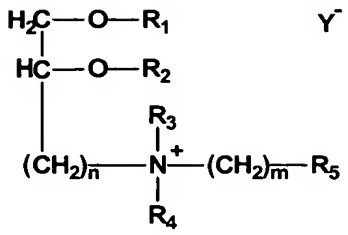
68. (New) The method according to claim 64, wherein R_1 and R_2 are identical and are selected from the group consisting of $C_{14}H_{29}$ and $C_{12}H_{25}$.

69. (New) The method according to claim 64, wherein R_3 and R_4 are selected from the group consisting of C_1-C_5 alkyl groups and C_1-C_5 heteroalkyl groups having one heteroatom therein.

70. (New) The method according to claim 69, wherein R_3 and R_4 are methyl groups.

71. (New) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

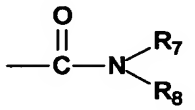


wherein

R_1 and R_2 are saturated or unsaturated C_{10}-C_{18} alkyl groups;

R_3 and R_4 are independently H; linear or branched, unsubstituted or substituted $C_{1\text{-}23}$ alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of $-O-(CH_2)_k-CH_3$,$-S-(CH_2)_k-CH_3$, and $X-(CH_2)_k-$, wherein X is a halide, and k is 0 to 4;

R_5 has the structure:



R_7 and R_8 are independently selected from the group defined for R_1, R_2, R_3 and R_4 and one of R_7 and R_8 can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein an amino nitrogen of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent is the N to which R_7 or R_8 is attached;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

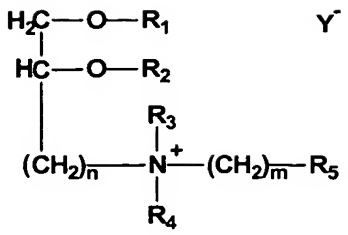
72. (New) The method according to claim 71, wherein R_1 and R_2 are identical and are selected from the group consisting of $C_{14}H_{29}$ and $C_{12}H_{25}$.

73. (New) The method according to claim 72, wherein R_3 and R_4 are selected from the group consisting of C_1-C_5 alkyl groups and C_1-C_5 heteroalkyl groups having one heteroatom therein.

74. (New) A compound according to claim 73, wherein R_3 and R_4 are methyl groups.

75. (New) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

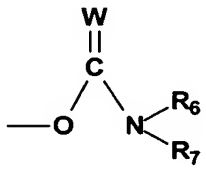


wherein

R_1 and R_2 are saturated or unsaturated C_{10}-C_{18} alkyl groups;

R^3 and R^4 are independently H; linear or branched, unsubstituted or substituted $C_{1\text{-}23}$ alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of $-O-(CH_2)_k-CH_3$,$-S-(CH_2)_k-CH_3$, and $X-(CH_2)_k-$, wherein X is a halide, and k is 0 to 4;

wherein R_5 has the structure



wherein

R_6 and R_7 are independently selected from the group defined for R_1, R_2, R_3 and R_4 and one of R_6 and R_7 can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein an amino nitrogen of said amino acid, peptide, polypeptide, protein, mono-, di- or

polysaccharide, or other bioactive or pharmaceutical agent is the N to which R_6 or R_7 is attached;

W is O, NR_8, NH, S, or Se;

R_8 is an alkyl group as defined for R_1 and R_2;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

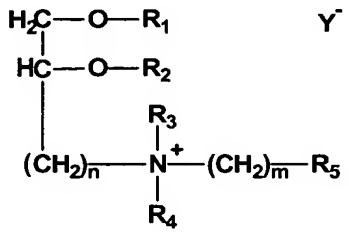
76. (New) The method according to claim 75, wherein R_1 and R_2 are identical and are selected from the group consisting of $C_{14}H_{29}$ and $C_{12}H_{25}$.

77. (New) The method according to claim 76, wherein R_3 and R_4 are selected from the group consisting of C_1-C_5 alkyl groups and C_1-C_5 heteroalkyl groups having one heteroatom therein.

78. (New) The method according to claim 77, wherein R_3 and R_4 are methyl groups.

79. (New) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

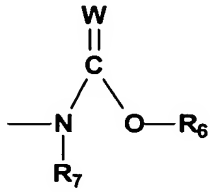


wherein

R_1 and R_2 are saturated or unsaturated C_{10}-C_{18} alkyl groups;

R_3 and R_4 are independently H; linear or branched, unsubstituted or substituted C_{1-23} alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of $-O-(CH_2)_k-CH_3$, $-S-(CH_2)_k-CH_3$, and $X-(CH_2)_k-$, wherein X is a halide, and k is 0 to 4;

wherein R_5 has the structure



wherein R_6 and R_7 are independently selected from the group defined for R_1, R_2, R_3 and R_4 and one of R_6 and R_7 can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent,

wherein a hydroxy oxygen of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent is the O to which R_6 is attached;

W is O, NR_8, NH, S, or Se;

R_8 is an alkyl group as defined for R_1 and R_2;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

80. (New) The method according to claim 79, wherein R_1 and R_2 are identical and are selected from the group consisting of $C_{14}H_{29}$ and $C_{12}H_{25}$.

81. (New) The method according to claim 80, wherein R_3 and R_4 are selected from the group consisting of C_1-C_5 alkyl groups and C_1-C_5 heteroalkyl groups having one heteroatom therein.

82. (New) The method according to claim 81, wherein R_3 and R_4 are methyl groups.

83. (New) The method according to claim 64, wherein

R_6 is selected from the group consisting of H, R_1, R_2, R_3, and R_4.

84. (New) The method according to claim 64, wherein

Z is O.

85. (New) The method according to claim 64, wherein

Z is NH or NR_1.

86. (New) The method according to claim 64, wherein said compound is selected from the group consisting of DORIE carboxylate (dioleyl Rosenthal Inhibitor Ether carboxylate), DMRIE carboxylate (dimyristyl Rosenthal Inhibitor Ether carboxylate), DMRIE carboxylate propyl amide, DMRIE carboxylate(methionine-methylester)amide, DMRIE carboxylate(methionine-leucine-methylester)amide, and DMRIE carboxylate(methionine-leucine-phenylalanine-methylester)amide.

87. (New) The method according to claim 71, wherein

R_7 and R_8 are independently selected from the group defined for R_1, R_2, R_3 and R_4.

88. (New) The method according to claim 71, wherein

R_1 and R_2 are C_{10} to C_{20} alkyl or alkenyl groups, R_7 is H, and R_8 is an amino acid or peptide.

89. (New) The method according to claim 75, wherein

R_6 and R_7 are independently selected from the group defined for R_1, R_2, R_3 and R_4.

90. (New) The method according to claim 75, wherein said compound is selected from the group consisting of DMRIE methyl carbamate (dioleyl Rosenthal Inhibitor Ether methyl carbamate), hydroxypropyl DMRIE methyl carbamate, and hydroxybutyl DMRIE methyl carbamate.